III. ENGINEERING

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Students with Advanced Placement credit:

Requirements for some courses in mathematical sciences can be met through Advanced Placement exam credit. Messiah College credit for various AP exams can be found at the following link, or through the registrar's website:

http://www.messiah.edu/info/21351/transfer ap clep courses/2107/apclepib equivalencies/3

Engineering

Degree Programs and Curriculum Details

Bachelor of Science in Biomedical Engineering (BSBME)
131 CR

Bachelor of Science in Civil Engineering (BSCE)
131 CR

Bachelor of Science in Electrical Engineering (BSEE)
131 CR

Bachelor of Science in Mechanical Engineering (BSME)
131 CR

Engineering Minors

Available to majors in another Engineering discipline

Biomedical Engineering
Civil Engineering
Electrical Engineering
Environmental Engineering
Mechanical Engineering

The BSE degree has been continuously accredited by ABET since 1993. That accreditation will be maintained indefinitely according to the typical ABET review cycle.

The BSBME, BSCE, BSEE, and BSME degrees are new at Messiah College beginning in Fall 2019. Students graduating May 2022 or later may choose these degree paths. Accreditation of new degree programs is not possible until the program has at least one graduate. Successful accreditation at that point would be retroactive to those graduates. Messiah College anticipates applying for accreditation in these programs in the Spring of 2022 with notification of official action by Summer 2023. All concentrations will be maintained within the BSE program through the transition and will also benefit from the curricular enhancements of the new programs.

III. Engineering 2022

Bachelor of Science in Engineering (BSE)

Biomedical Concentration 128 CR

Civil Concentration 128 CR

Electrical Concentration 128 CR

Mechanical Concentration 128 CR

Computer Concentration 128 CR

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Environmental Concentration 128 CR

General Engineering 123 CR

Consider pairing with a Messiah College minor (samples below) or with courses recommended for Pre-Med or Pre-Health careers by our MC Pre-Health Professions Advising Service.

Physics
Chemistry
Business Administration
Leadership
Computer Science
Economic Development
Spanish
Music
Pre-Law

8 Semester Plans

Biomedical Engineering (BSBME)

MATH 111 (CHEM 105 (COMM 105 FIDFY 101 FIDFY 1	First Year – Fall Intro to Engineering Calculus I* Chemistry* Fundamentals of Oral Communication* First Year Seminar** Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II 2nd Language requirement*	2 4 4 3 3 16 4 4 4 4 4	ENGR 112 MATH 112 PHYS 211 IDCR 151 Varies ENGR 211 ENGR 212 ENGR 215 ENGR 323	First Year – Spring Engineering Design Tools Calculus II General Physics I Created and Called for Community* 1st Language requirement* Total Sophomore – Spring Project Management Programming for Engineers Circuits I	2 4 4 3 3 16
MATH 111 (CHEM 105 COMM 105 FIDFY 101 FIDFY 10	Calculus I* Chemistry* Fundamentals of Oral Communication* First Year Seminar** Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	4 3 3 16 4 3 4	MATH 112 PHYS 211 IDCR 151 Varies ENGR 211 ENGR 212 ENGR 215	Calculus II General Physics I Created and Called for Community* 1st Language requirement* Total Sophomore – Spring Project Management Programming for Engineers Circuits I	4 4 3 3 16
CHEM 105 COMM 105 FIDFY 101 FIDFY 10	Chemistry* Fundamentals of Oral Communication* First Year Seminar** Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	4 3 3 16 4 3 4 4	PHYS 211 IDCR 151 Varies ENGR 211 ENGR 212 ENGR 215	General Physics I Created and Called for Community* 1st Language requirement* Total Sophomore – Spring Project Management Programming for Engineers Circuits I	4 3 3 16
COMM 105 FI IDFY 101 FI	Fundamentals of Oral Communication* First Year Seminar** Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	3 3 16 4 3 4 4	ENGR 211 ENGR 215	Created and Called for Community* 1st Language requirement* Total Sophomore – Spring Project Management Programming for Engineers Circuits I	3 3 16
ENGR 214 PENGR 216 PMATH 211 C	First Year Seminar** Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	3 16 4 3 4 4	ENGR 211 ENGR 212 ENGR 215	1st Language requirement* Total Sophomore – Spring Project Management Programming for Engineers Circuits I	16 1 1 2
ENGR 214 I ENGR 216 I MATH 211 (Total Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	16 4 3 4 4	ENGR 211 ENGR 212 ENGR 215	Sophomore – Spring Project Management Programming for Engineers Circuits I	16
ENGR 216 I MATH 211 (Sophomore – Fall Materials Engineering Mechanics I Calculus III General Physics II	4 3 4 4	ENGR 212 ENGR 215	Sophomore – Spring Project Management Programming for Engineers Circuits I	1 2
ENGR 216 I MATH 211 (Materials Engineering Mechanics I Calculus III General Physics II	3 4 4	ENGR 212 ENGR 215	Project Management Programming for Engineers Circuits I	2
ENGR 216 I MATH 211 (Materials Engineering Mechanics I Calculus III General Physics II	3 4 4	ENGR 212 ENGR 215	Project Management Programming for Engineers Circuits I	2
ENGR 216 I MATH 211 (Mechanics I Calculus III General Physics II	3 4 4	ENGR 212 ENGR 215	Programming for Engineers Circuits I	2
MATH 211 (Calculus III General Physics II	4 4	ENGR 215	Circuits I	ļ
	General Physics II	4			- 4
				Mechanics II	3
Varies 2	3 - 3 - 1		MATH 270	Linear and Differential Methods	3
			PHIL or RELI	Philosophy or Religion meeting QuEST*	3
	Total	18		Total	16
					-
Junior – Fall				Junior – Spring	
ENGR 213	Engineering Statistics	3	ENGR 332	BME Laboratory Techniques	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	Varies	Biomedical Science Elective	3
ENGR 432 [Design of Medical Devices	4	BIBL 2xx	Bible*	3
HIST 1xx I	History meeting QuEST*	3	ENGL 1xx	Literature meeting QuEST*	3
ENGR 331	Biomechanics	4	ENGR 371	Thermodynamics	3
WELL 1xx \	Wellness*	1			
	Total	17		Total	16
	Senior – Fall			Senior – Spring	
ENGR 302	Seminar II	1	ENGR 415	Engineering Project	2
	Control Systems	4	Varies	Biomedical Science Elective	4
······································	Biomedical Instrumentation	4	Varies	Social Science/History meeting QuEST*	3
	Fluid Dynamics	4	THEO 2xx	Christian Beliefs*	3
	Engineering Project	2	Varies	Ethics/WV/Pluralism*	3
	3rd Language/NonWestern/CrossCultural*	2-3	- 41100		
	Total	17-18		Total	15

Civil Engineering (BSCE) 8 Semester Plan

Course #	Course Name	Credits	Course #	Course Name	Credits
	First Year – Fall			First Year – Spring	
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
	Total	16		Total	16
	Sophomore – Fall			Sophomore – Spring	
ENGR 214	Materials Engineering	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 215	Circuits I	4
MATH 211	Calculus III	4	ENGR 212	Programming for Engineers (J-term)	2
GEOL 201	Foundations of Geology	4	ENGR 213	Engineering Statistics	3
Varies	2nd Language*	3	ENGR 323	Mechanics II	3
			MATH 270	Linear and Differential Methods	3
			WELL 1xx	Wellness*	1
	Total	18		Total	17
	Junior – Fall			Junior – Spring	
ENGR 301	Seminar I	1	ENGR 344	Construction Methods and Materials	4
ENGR 341	Structural Design I	4	ENGR 345	Fluid Mechanics	4
ENGR 353	Environmental Engineering	4	ENGR 415	Engineering Project	1
ENGR 415	Engineering Project	1	ENGR 441	Structural Design II	4
Varies	Social Science/History*	3	BIBL 2xx	Bible*	3
PHIL or RELI	Philosophy or Religion meeting QuEST*	3			
	Total	16		Total	16
	Senior – Fall			Senior – Spring	
ENGR 302	Seminar II	1	ENGR 347	Transportation Engineering	3
ENGR 346	Water Resources Engineering	3	ENGR 415	Engineering Project	2
ENGR 415	Engineering Project	2	ENGR 444	Civil Engineering Design	3
ENGR 443	Geotechnical Engineering	4	Varies	3rd Language/NonWestern/Cross Cultural*	2-3
HIST 1xx	History*	3	THEO 2xx	Christian Beliefs*	3
ENGL 1xx	Literature*	3	Varies	Ethics/WV/Pluralism*	3
	Total	16		Total	16-17

Electrical Engineering (BSEE) 8 Semester Plan

Course #	Course Name	Credits	Course #	Course Name	Credits
	First Year – Fall			First Year – Spring	
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
	Total	16		Total	16
	Sophomore – Fall			Sophomore – Spring	
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 361	Circuits II	4
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
			PHIL or RELI	Philosophy or Religion meeting QuEST*	3
	Total	18		Total	17
		<u> </u>		***	<u> </u>
	Junior – Fall			Junior – Spring	
ENGR 301	Seminar I	1	ENGR 213	Engineering Statistics	3
ENGR 362	Analog Electronics	3	ENGR 364	Electrical Devices	4
ENGR 415	Engineering Project	1	ENGR 365	Linear Systems	3
ENGR 462	Power Electronics	4	ENGR 415	Engineering Project	1
BIBL 2xx	Bible*	3	HIST 1xx	History*	3
WELL 1xx	Wellness*	1	THEO 2xx	Christian Beliefs*	3
ENGL 1xx	Literature*	3			
	Total	16		Total	17
	Senior – Fall			Senior – Spring	
ENGR 302	Seminar II	1	ENGR 363	Embedded Systems Design	4
ENGR 324	Control Systems	4	ENGR 415	Engineering Project	2
ENGR 367	Electromagnetics	3	ENGR 421	Robotic Systems	4
ENGR 415	Engineering Project	2	ENGR 461	Communication Systems	3
Varies	Social Science/History*	3	Varies	Ethics/WV/Pluralism*	3
Varies	3rd Language/NonWestern/Cross Cultural*	2-3			
	Total	15-16		Total	16

Mechanical Engineering (BSME) 8 Semester Plan

Course #	Course Name	Credits	Course #	Course Name	Credits
	First Year – Fall			First Year – Spring	
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
	Total	16		Total	16
	Sophomore – Fall			Sophomore – Spring	
ENGR 214	Materials Engineering	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 215	Circuits I	4
MATH 211	Calculus III	4	ENGR 212	Programming for Engineers (J-term)	2
PHYS 212	General Physics II	4	ENGR 323	Mechanics II	3
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
Varios	Zild Edingdage		ENGL 1xx	Literature*	3
			LIVOL 1XX	Litoraturo	
	Total	18		Total	16
	Junior – Fall			Junior – Spring	
ENGR 213	Engineering Statistics	3	ENGR 376	Dynamics and Vibrations	4
ENGR 371	Thermodynamics	3	ENGR 378	Manufacturing Processes	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 472	Mechanical Design	4	Varies	Social Science/History*	3
ENGR 415	Engineering Project	1	BIBL 2xx	Bible*	3
WELL 1xx	Wellness*	1	Varies	3rd Language/NonWestern/Cross Cultural*	2-3
PHIL or RELI	Philosophy or Religion meeting QuEST*	3	Varios	ord Language/Nonwestern/Oross Cultural	2-0
	Total	16		Total	16-17
	Senior – Fall			Senior – Spring	
ENGR 302	Seminar II	1	ENGR 415	Engineering Project	2
ENGR 324	Control Systems	4	ENGR 421	Robotic Systems	4
ENGR 373	Instrumentation and Measurement	3	ENGR 471	Heat Transfer and Design	4
ENGR 377	Fluid Dynamics	4	HIST 1xx	History*	3
ENGR 415	Engineering Project	2	Varies	Ethics/WV/Pluralism*	3
THEO 2xx	Christian Beliefs*	3			
	T-1-1	47		Taba	46
	Total	17		Total	16

Engineering (BSE) with Computer Concentration 8 Semester Plan

Course #	Course Name	Credits	Course #	Course Name	Credits
	First Year – Fall			First Year – Spring	-
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
	Total	16		Total	16
	Sophomore – Fall			Sophomore – Spring	
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	ENGR 361	Circuits II	4
Varies	2nd Language*	3	MATH 270	Linear and Differential Methods	3
			CIS 284	Computer Programming II	3
	Total	18		Total	17
	Junior – Fall			Junior – Spring	
ENGR 213	Engineering Statistics	3	ENGR 365	Linear Systems	3
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 362	Analog Electronics	3	Varies	Social Science/History*	3
ENGR 415	Engineering Project	1	PHIL or RELI	Philosophy or Religion meeting QuEST*	3
CIS 384	Elements of Computer Systems	3	WELL 1xx	Wellness*	1
BIBL 2xx	Bible*	3	HIST 1xx	History*	3
ENGL 1xx	Literature*	3		·	
	Total	17		Total	14
	Contain Fall			Cardan Cordan	
ENCD 202	Senior – Fall	1		Senior – Spring	
ENGR 302	Seminar II	1	ENCD 262	Emboddod Cystomo Doning	1
ENGR 324	Control Systems	4	ENGR 363	Embedded Systems Design	4
ENGR 415	Engineering Project	2	ENGR 415	Engineering Project	2
Varies	Computer Engineering Elective	3-4	MATH 180	Discrete Mathematics	3
CIS 385	Data Structures and Algorithms	3	THEO 2xx	Christian Beliefs*	3
Varies	3rd Language/NonWestern/Cross Cultural*	2-3	Varies	Ethics/WV/Pluralism*	3
	Total	15-17		Total	15

Engineering (BSE) with Environmental Concentration 8 Semester Plan

Course #	Course Name	Credits	Course #	Course Name	Credits
	First Year – Fall			First Year – Spring	·
ENGR 111	Intro to Engineering	2	ENGR 112	Engineering Design Tools	2
MATH 111	Calculus I*	4	MATH 112	Calculus II	4
CHEM 105	Chemistry*	4	PHYS 211	General Physics I	4
IDFY 101	First Year Seminar*	3	IDCR 151	Created and Called for Community*	3
COMM 105	Fundamentals of Oral Communication*	3	Varies	1st Language*	3
	Tota	l 16		Total	16
	Sophomore – Fall			Sophomore – Spring	
ENGR 215	Circuits I	4	ENGR 211	Project Management	1
ENGR 216	Mechanics I	3	ENGR 212	Programming for Engineers (J-term)	2
MATH 211	Calculus III	4	ENGR 214	Materials Engineering	4
PHYS 212	General Physics II	4	MATH 270	Linear and Differential Methods	3
			CHEM 106	Chemistry* II	4
			Varies	2nd Language*	3
	Tota	l 15		Total	17
	Junior – Fall			Junior – Spring	
ENGR 213	Engineering Statistics	3	ENGR 345	Fluid Mechanics	4
ENGR 301	Seminar I	1	ENGR 415	Engineering Project	1
ENGR 353	Environmental Engineering	4	ENGR 451	Water and Wastewater Management	3
ENGR 371	Thermodynamics	3	GIS 245	Intro to Geographical Info Sys	3
ENGR 415	Engineering Project	1	ENGL 1xx	Literature*	3
WELL 1xx	Wellness*	1	Varies	3rd Language/NonWestern/Cross Cultural*	2-3
Varies	Social Science/History*	3			
	Tota	l 16		Total	16-17
	Conion Fall			Capian Carina	
ENGR 302	Senior – Fall Seminar II	1	PHIL or RELI	Senior – Spring	ာ
		1		Philosophy/Religion meeting QuEST*	3
ENGR 346 ENGR 415	Water Resources Engineering	3 2	ENGR 415	Engineering Project	2 3
	Engineering Project Environmental Elective	3	ENGR 453 HIST 1xx	Hazardous Waste and Air Pollution Mgmt	<u> </u>
Varies	Environmental Science Elective			History* Christian Beliefs*	3
Varies	Bible*	3	THEO 2xx		3
BIBL 2xx	DINIE	3	Varies	Ethics/WV/Pluralism*	3
	Tota	l 16		Total	17